

CENTRAL INTELLIGENCE AGENCY

REPORT

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- 25 YEAR RE-REVIEW

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It was contemplated that he would carry out investigations concerning the exchange of fluorine for chlorine in organic compounds utilizing such catalytic agents as antimony fluorides. It was also thought that lead fluoride should serve as a fluorinating agent. Of special interest was the facility of halogen interchange depending upon the influence of additional functional groups, for example, the labilization of aromatically bound chlorine by ortho- and para-substituted nitro groups. In this respect, picryl chloride should be readily transformed into the corresponding fluoride. However, these investigations would serve only to substantiate previous research work, probably that undertaken by [] scientists. The three assistants still active at Greifswald, all of whom will probably finish their research work in the course of the coming six months, started their investigations at the end of 1950. They are now in their tenth semester and are between 23 and 25 years of age.

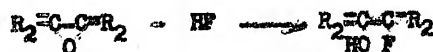
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3. Part of the required hydrogen fluoride used in the research projects is received from industrial sources. That part which must be entirely pure and anhydrous is produced in the University laboratory by heating carefully dried potassium hydrogen fluoride (KHF_2). Experimental reaction equipment is made of silver, while the storage containers are made of plastic.

4. Paul Friedrich Foerster []

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Foerster is doing research on the reactions of hydrogen fluoride (HF) with ethylene oxide type compounds. Because of the vigor of the reaction, an ether solution of ethylene oxide was employed while the HF was led into it. The starting point of this research is based upon the results obtained by Dr. Wiechert in the last years of World War II which indicated that ethylene oxide and similar compounds should be transformed into fluorhydrins through careful hydrofluorination.



Dr. Wiechert maintained that he had already produced the fluorhydrin of simple ethylene oxide in this manner. However, Foerster's work had not proved this to date. Foerster obtained polymerization products of various chain lengths which he fractionally distilled. The polymeride obtained was a colorless oil-like liquid boiling over a wide temperature range. With increasing boiling temperature of the fractions, the chain length continually increased, as indicated by refractometric determinations. Although details of the ensuing research after the spring of 1952 are not known, it was believed that indefinable reactions took place when complicated ethylene oxide type compounds were employed in this study. In the course of the reactions, ether-like products were obtained which were mixed with various fluorinated substances. It appeared certain that under vigorous reaction conditions such as concentrated solutions, minimal cooling and rapid introduction of hydrogen fluoride, the polymerizing effect of the fluoride was always dominant. As far as was known, no fluorhydrins had yet been obtained.

5. Roman Hoffmeister []

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Hoffmeister is working on fluorination with the aid of thionyl fluoride. The introduction of hydrogen fluoride (HF) into thionyl chloride (SOCl_2) under anhydrous conditions produces hydrogen chloride (HCl) and thionyl fluoride (SOF_2). The hydrogen chloride is washed out of the mixture of the two volatile gaseous products with water. To a great extent, the thionyl fluoride is resistant to hydrolysis and is employed directly for the fluorination of compounds containing carbonyl groups. Principally, ketones were considered for fluorination. Details of the results are not known, but apparently the research work has taken the expected course.

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6. Fräulein Eleanore Goerlich

Her father is deceased and her mother is in Stralsund. Miss Goerlich is engaged to Hans Thom, dipl. physicist from Prof. Seeliger's scientific group in Greifswald. Her area of investigation is the properties of hydrogen fluoride and of acidic ion-exchange resins (Wofatites) as catalysts for the Fries transformation:

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wherein aromatic orthocarboxylic esters form ortho, para-dihydroxyketones. As esters, simple substances such as salol (phenyl salicylate), pyrocatechol diacetate, anisol esters, benzoates and the like were employed. For the transformation with acidic ion-exchange resins (Wofatites), ether, dioxane, benzene, etc. served as solvents wherein the participation of the solvent, as is the case with alcohols and acids, is excluded. As of 1952, the ion-exchange resin research was negative even when the catalysts were boiled and activated previously with acids. The hydrogen ion concentration was believed to be too low. No information was available concerning the ensuing research work.

Comments:

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- 1/ "Teflon" is a polytetrafluoroethylene product.
- 2/ To obtain a professorial chair.
- 3/ A process whereby wood is converted to sugar-like materials by hydrolysis.

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